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The method of in vivo evaluation of hemostasis: Spatial thrombodynamics

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Abstract

© W. S. Maney & Son Ltd 2015. Background: Coagulation is a cascade of reactions that eventually leads to formation of thrombin and fibrin. The two most frequently used tests to describe the coagulation system are activated partial thromboplastin time and international normalized ratio. Both tests are performed in vitro by mixing coagulation factors and measuring the time until the clot forms, but neither represents the biology of coagulation in vivo. Objective: To assess the diagnostic potential of thrombodynamics. Methods: Publications from potentially relevant journals were searched in Medline and by hand. Results and discussion: In the spatial clot growth assay, hypercoagulability was characterized by quantitative and qualitative changes. It identified hypercoagulation in rats with induced microvascular thrombosis. The method was used to study coagulation in hemophilia after inhibition of tissue factor pathway inhibitor. It may be used in platelet-free, platelet-poor, and platelet-rich plasma. In a small study the assay was able to predict thrombosis in patients with sepsis. Conclusion: Thrombodynamics is a promising method for measuring coagulation by imitation of in vivo conditions, and is being used in basic research. More work and correlative clinical investigations are still required to determine whether this method will be clinically useful in the future.

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Keywords

Blood coagulation, Blood coagulation tests, Hemostasis, Thrombophilia, Thrombosis